Natural Heritage &
Endangered Species
Program

Commonwealth of Massachusetts
Division of Fisheries & Wildlife
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Westborough, MA 01581
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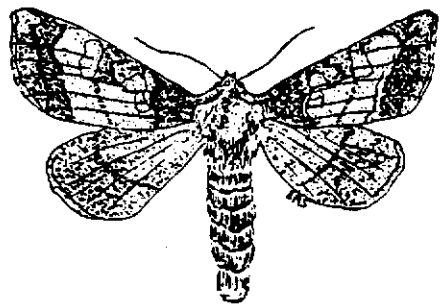
MASSACHUSETTS THREATENED WILDLIFE

Water-willow Borer
(Papaipema sulphurata)

DESCRIPTION: The Water-willow Borer is a nocturnal moth of the Noctuidae Family, with a wingspan of 3 to 4 cm (1.25 to 1.5 inches). The coloration of its forewings is predominantly chrome-yellow to ochre, shaded with purple at the base and outer edges. Reniform (kidney-shaped) spots and orbicular spots are present, but are the same color as the rest of the wing. The hindwings are much duller, brown with ochre shading and a medial band.

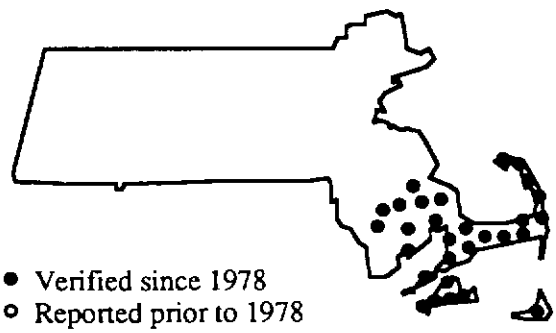


Eileen Sonnenberg, Cape Naturalist, Summer 1988

SIMILAR SPECIES: The Water-willow Borer is almost indistinguishable from the Burdock Borer Moth (Papaipema cataphracta), which is slightly less rusty in color. The larvae of P.cataphracta bore into and feed on many different species of plants, but rarely if ever utilize water-willow (Decodon verticillatus), which is the only plant used by P. sulphurata. In addition, P. cataphracta is absent from the coastal plain and therefore the ranges of the two species do not overlap.

RANGE: The Water-willow Borer is found only in southeastern Massachusetts and nowhere else in the world; it is Massachusetts' most globally restricted species of Lepidoptera.

HABITAT IN MASSACHUSETTS: Water-willow Borers are found only on Massachusetts' coastal plain, in the shallowest portions of vernal ponds and seasonally flooded swamps, and along upland edges of streams, ponds, and other permanent bodies of water. Only wetlands with an significant amount of water-willow within a restricted shallow water zone are inhabited by P. sulphurata.



- Verified since 1978
- Reported prior to 1978

Massachusetts Distribution by Town

BEHAVIOR / LIFE HISTORY: Adult female Water-willow Borers mate and lay eggs in late September or early October, presumably at the base of a clump of water-willows. The eggs lie dormant through the winter, and the larvae hatch in mid to late May. They must immediately find a fresh willow shoot and then bore into the stem, where they feed for most of the summer. A water-willow stem occupied by a larva can be recognized by a large round hole on the lower end of the stem, through which the larva removes its droppings. Pupation occurs inside the stem in mid-August, and the adult Water-willow Borer finally emerges from the stem in mid to late September. Adult Water-willow Borers are excellent fliers, and have a relatively long life span (three weeks) compared to many other moths, during which the adult Water-willow Borers must find a mate and reproduce before they die in early October.

POPULATION STATUS: The Water-willow Borer is listed as a Threatened Species in Massachusetts, due to its extremely small global distribution and low population size. There are 2 historical sites and 59 current sites in 29 towns in Massachusetts. Populations of Water-willow Borers at any given site appear to be unstable; local extinctions may commonly occur, followed by recolonization of the site by Water-willow Borers from other nearby areas. It is unknown why P. sulphurata is restricted to southeastern Massachusetts despite its excellent flying ability and the abundance of water-willow in the eastern United States. There are some possible explanations, however. It may be that the water-table fluctuations in Massachusetts' coastal plain are different from any other area in the Northeast; P. sulphurata may only be able to survive in these very specific water-table conditions, which partially expose the lower stems of water-willows above water in summer, but still leave them in enough water to deter predation by rodents. It is recommended that the water level of P. sulphurata habitats not be changed by damming, draining or other activities, as this could adversely affect the moths. In addition, pesticides should not be used in these areas, and trails should not be established along the upper edges of P. sulphurata ponds to prevent trampling of the water-willow.